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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,515	04/10/2001	Thomas P Dick	70006209-1	1240

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EXAMINER	
CHUNG, DANIEL J	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/832,515	DICK ET AL.	
	Examiner	Art Unit	
	Daniel J Chung	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-11,13 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-11,13 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-4,6-11 and 13-14 are presented for examination. This office action is in response to the response filed on 8-9-2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4,6-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (5,535,317) in view of Blades et al (5,990,888), and further in view of Itoh et al. (5,926,186)

Regarding claim 1, Tanaka et al discloses that the claimed feature of an interactive method for demonstrating an interrelationship between different representations of a mathematical relationship, including the steps of: (a) defining a mathematical equation ["functional formulas"]; (c) simultaneously displaying at least two of multiple representations of the defined mathematical equation, wherein the available types of multiple representations include a graphical representation in the form of a graph, a numerical representation in the form of a table of values, and a symbolic representation in the form of an equation expressed in terms of standard mathematical

nomenclature, wherein one of the displayed representations is the graphical representation; (c) manipulating [Fig 6B-6D, Fig 16] the graphical representation; and (d) processing the manipulation to substantially simultaneously and correspondingly update the other displayed representation of the mathematical relationship in accordance with the manipulation of the graphical representation, whereby a user of the method is able to substantially immediately observe the effect of changes made to the graphical representation via its manipulation on the other of the at least two displayed representations. (See Abstract, col 1 line 40-col 2 line 9)

Tanaka et al does not explicitly disclose that simultaneously displaying two of multiple representations of the mathematical equation and updating the other representation of the mathematical relationship in accordance with the manipulation of the graphical representation. However, such limitations are shown in the teaching of Blades et al. ["manipulating graphic object, wherein automatically update data structures for variables having an altered value in response to the alteration of the value for the at least one other variable". (See Fig 3, Abstract, col 1 line 6-11, col 1 line 25-44, col 1 line 56-col 2 line 14, col 5 line 25-33, col 9 line 10+) It would have been obvious to one skilled in the art to incorporate the teaching of Blades et al into the teaching of Tanaka, in order to "provide a user an efficient way to manipulate a graph that is defined by a number of different variables and updating data structures" (See col 1 line 56-58 in Blades et al), as such improvement is also advantageously desirable in the teaching of

Tanaka for simultaneously displaying mathematical formula and its graphical representation with better analytical understanding of interrelationship of two.

Tanaka et al does not specifically disclose that "shifting the graph with respect to a set of coordinate axes and shrinking or stretching the graph with respect to a particular point in a coordinate plane." However, such limitations are shown in the teaching of Itoh et al. (i.e. editing graph with shifting/moving the graph (See Fig 2-4) and deforming [shrinking/stretching] the graph (See Fig 5-6)] It would have been obvious to one skilled in the art to incorporate the teaching of Itoh et la into the teaching of Tanaka et al, in order to effectively manipulate the graph, as such improvement is also advantageously desirable in the teaching of Tanaka for observing the interrelationship of edited graphic representation and its displayed mathematical formula. Furthermore, utilizing the graphic translation [i.e. shifting] and graphic deformation [i.e. shrinking, stretching] within graphic display system is well known in an analogous art to alter/edit the graph in many ways, therefore implementing such graphic editing mode [i.e. translation, deformation] into the teaching of Tanaka would have been obvious to one skilled in the art.

Regarding claim 2, Tanaka et al discloses that step of defining a mathematical equation includes selecting ["operating a list key"; A2, S3] a mathematical equation from a list of predefined mathematical equations. (See Abstract line 4-6, Fig 3, Fig 4)

Regarding claim 3, Tanaka et al discloses that the list of predefined mathematical equations includes equations selected from one or more of: (a) linear mathematical relations; (b) polynomial mathematical relations; (c) exponential mathematical relations; (d) logarithmic mathematical relations; (e) power mathematical relations; (f) trigonometric mathematical relations; and (g) conic section mathematical relations. (See Fig 6A)

Regarding claim 4, Tanaka et al discloses that the list of predefined mathematical equations includes at least two equations selected from: (a) a linear mathematical equation described by y=m(x-h)+k; (b) a quadratic mathematical equation described by y=a(x-h).sup.2+k; ["Y=x.sup.2+3X-5"] (c) a circular mathematical equation described by (x-h).sup.2+(y-k).sup.2=r.sup- .2; (d) an elliptical mathematical equation described by 4 (x - h) 2 a 2 + (y - k) 2 b 2 = 1 ;(e) a hyperbolic mathematical equation described by 5 (x - h) 2 a 2 - (y - k) 2 b 2 = 1 ;(f) a hyperbolic mathematical equation described by 6 (y - k) 2 b 2 - (x - h) 2 a 2 = 1 ;(g) a parabolic mathematical equation described by y=m(x-h).sup.2+k; (h) a parabolic mathematical equation described by (y-k.sup.2)=c(x-h); (i) a general exponential mathematical equation described by y=ba.sup.x+k; (j) a natural exponential mathematical equation described by y=be.sup.ax+k; (k) a logarithmic mathematical equation of the form y=b1n(a(x-h))+k; (l) a power mathematical equation described by y=a(x-h).sup.r+k; (m) a sine mathematical equation described by y=bSin(a(x-h))+k; ["Y=sinx"] and (n) a cosine mathematical

equation described by y=bCos(a(x-h))+k; where x and y are variable parameters and a, b, m, h, k and r are parameters according to standard mathematical nomenclature, the numerical values for which included in a particular predefined mathematical relation are user definable. (See Fig 6A)

Regarding claim 6, Tanaka fails to teach that using a programmed computer in combination with a stylus device. However, using a stylus device is well known in the art (with touch screen unit), which gives a convenient way to input data in user-friendly manner. Therefore, it would have been obvious to one skilled in the art to employ the stylus device into the teaching of Tanaka.

Regarding claim 7, claim 7 is similar in scope to the claims 1 and 6, and thus the rejections to claims 1 and 6 hereinabove are also applicable to claim 7.

Regarding claims 8-11 and 14, claims 8-11 and 14 are similar in scope to the claims 1-4 and 7, and thus the rejections to claims 1-4 and 7 hereinabove are also applicable to claims 8-11 and 14.

Regarding claim 13, Tanaka et al discloses that a hand-held computer device ["calculator"]. (See Fig 1)

Claims 1,7 and 14 are once again rejected under 35 U.S.C. 103(a) as being unpatentable over Ogino (6,081,819) in view of Itoh et al. (5,926,186)

Regarding claim 1, Ogino discloses that the claimed feature of an interactive method for demonstrating an interrelationship between different representations of a mathematical relationship, including the steps of: (a) defining a mathematical equation ["numerical formulas"]; (c) simultaneously displaying at least two of multiple representations of the defined mathematical equation [i.e. equations in Fig 5], wherein the available types of multiple representations include a graphical representation in the form of a graph [i.e. graphs in Fig 5], a numerical representation in the form of a table of values [i.e. tables with input values in Fig 5], and a symbolic representation in the form of an equation expressed in terms of standard mathematical nomenclature [i.e. mathematical equations in Fig 5], wherein one of the displayed representations is the graphical representation; (c) manipulating [by pressing 23,24 in Fig 5] the graphical representation; and (d) processing the manipulation to substantially simultaneously and correspondingly update the other displayed representation of the mathematical relationship in accordance with the manipulation of the graphical representation, whereby a user of the method is able to substantially immediately observe the effect of changes made to the graphical representation via its manipulation on the other of the at least two displayed representations, wherein shifting the graph with respect to a set of coordinate axes. (See Abstract, Fig 5)

Ogino does not specifically disclose that "shrinking or stretching the graph with respect to a particular point in a coordinate plane." However, such limitations are shown in the teaching of Itoh et al. (i.e. editing graph with deforming [shrinking/stretching] the graph (See Fig 5-6)] It would have been obvious to one skilled in the art to incorporate the teaching of Itoh et la into the teaching of Ogino, in order to effectively manipulate the graph, as such improvement is also advantageously desirable in the teaching of Ogino for observing the interrelationship of edited graphic representation [i.e. deformed] and its displayed mathematical formula. Furthermore, utilizing the graphic deformation [i.e. shrinking, stretching] within graphic display system is well known in an analogous art to alter/edit the graph in many ways, therefore implementing such graphic editing mode [i.e. deformation] into the teaching of Ogino would have been obvious to one skilled in the art.

Regarding claims 7 and 14, claims 7 and 14 are similar in scope to the claim 1, and thus the rejections to claim 1 hereinabove is also applicable to claims 7 and 14.

Response to Arguments/Amendments

Applicant's arguments with respect to claims 1-4,6-11 and 13-14 have been considered but are moot in view of the new ground(s) of rejection. Specifically, in response to the applicant's argument that the cited references do not disclose shifting a graph of the graphical representation and shrinking or stretching the graph, the newly

submitted reference (Itoh et al) clearly show such graphical editing/manipulating. See the rejection hereinabove.

Conclusion

Applicant's amendment [i.e. "shifting", "shrinking", "stretching"] necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Chung whose telephone number is (703) 306-3419. He can normally be reached Monday-Thursday and alternate Fridays from 7:30am- 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael, Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306 (Central fax)

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

djc
January 4, 2005

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600